FISCAL RESEARCH CENTER

Growth and Local Government Spending In Georgia

Nara Monkam

Fiscal Research Center
Andrew Young School of Policy Studies
Georgia State University
Atlanta, GA

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Executive Summary

Introduction

This report is a technical analysis that estimates the effect of local government spending on economic growth at the county level in Georgia. Recent studies in the growth and economic development literature have emphasized the impact of government spending on growth at the national and state levels, but few of these studies have attempted to identify growth–enhancing government expenditures at the local level. Such studies are of great importance from a policy design point of view for the reason that if there is evidence of a positive effect of government spending on economic growth, it would be imperative to identify the adequate spending compositions needed to improve the growth impact of local government spending.

Potential Links between Economic Growth and Local Government Expenditures

According to Bartik (2003), Bell et al. (2005), and the local economic development literature in general, economic growth and economic development in a particular jurisdiction are primarily determined by the strength of the private sector in that jurisdiction; in particular, its level of investment and economic activity. Furthermore, theoretical and empirical literature on the determinants of growth and development and surveys of business executives suggest that business location decisions are first and foremost affected by factors (or economic fundamentals) such as access to markets, cost and quality of labor, quality transportation systems and infrastructure (e.g. roads, highways, airports, railroad systems, telecommunications, and sewer systems), access to raw materials and supplies, utility costs, and measures of quality of life such as good schools, quality institutes of higher education, health services, recreational facilities, low crime, affordable housing, and good weather.

The aforementioned studies argued that through their discretionary power over taxing and spending policies and regulatory policies, state and local governments may affect economic growth and economic development by developing and investing in public services that have a positive impact on the above mentioned

economic fundamentals; fundamentals that are crucial in attracting businesses and economic activity in a specific jurisdiction. Specifically, Bell et al. (2005) indicated that in general, survey research studies have led to the conclusion that "state and local spending in a number of sectors that influence directly the cost of doing business and the quality of the labor force rank ahead of taxes as a major determinant in business location decisions" (Bell et al. 2005, 56). In other words, although local tax policy as well as economic fundamentals has been known to affect business location decisions, what matters more than the level of tax in a particular locality is how revenues are used to finance local public services that prove attractive to businesses looking to relocate or expand. It is within this context that we examine the extent to which local government expenditures affect economic growth at the county level in Georgia.

Beyond the question of how local governments could affect economic growth through their provision of local public services, there is also the issue of reverse causality, namely that economic growth could potentially induce larger local government expenditures (this is the endogeneity or simultaneity bias). Evidently, if expenditure variables are not strictly exogenous, the resulting empirical estimation of the impact of local public spending on economic growth would be in general biased and inconsistent. Some measures were taken to correct or reduce this endogeneity issue.

Empirical Analysis

Variables Description and Data Sources

In this report, we examine whether local expenditures at the county level affect economic growth in Georgia. The data used are for all 159 counties in the state pooled over the years 1992, 1997, and 2002. In this study, we choose change in per capita personal income as the variable of interest to represent economic growth for the reason that it reflects per person changes in economic well-being at the county level.

The description and source of all variables used in the analysis are presented in Table I. It is important to note that all government finance data, which are government finances of *all* local governments aggregated at the county area level, are

TABLE I. VARIABLE DESCRIPTIONS

County Level Variables	Description	Sources
Incgrowth	Per capita Personal Income growth (five-year growth rate)	Bureau of Economic Analysis (Local area annual estimates)[1]
Population	Population, in whole numbers	
Educ_Fte	Elementary and Secondary Education, Total Expenditures Per FTE Student ($)	U.S. Census Bureau (County Area Finance) & GA Department of Education (for FTE data)[2]
Fire/police	Police and fire protection, Total Expenditures per capita ($)	U.S. Census Bureau (County Area Finance)[3]
Health_hosp	Health and Hospitals, Total Expenditures per capita ($)	id.
Highways	Total Highways, Total Expenditures per capita aggregated at the county level ($)	id.
Housing/Parks	Housing, Community Development and recreational per capita Expenditures ($)	id.
Welfare	Public Welfare, Total Expenditures per capita ($)	id.
Sewerage	Sewerage, Total Expenditures per capita ($)	id.
Debt	Total Debt Outstanding at the end of the FY per capita ($)	id.
Millrate	Property Tax Rates (Millage Rates, County Unincorporated and School)	Georgia Department of Revenue, (Local Government Services Division)[4]
Salesrate	County Sales Tax Rates (%)	Georgia Department of Revenue[5]
Urban	Dummy Variable equal to 1 if county population >=100,000 and zero otherwise	id.
Unemployment	County Unemployment Rates, Annual Averages (%)	Bureau of Labor Statistics (Local Area Unemployment Statistics)[6]

[1] http://www.bea.gov/regional/reis/default.cfm?catable=CA1-3&section=2, accessed September 17, 2008.
[2] http://app3.doe.k12.ga.us/ows-bin/owa/fte_pack_enrollgrade.entry_form, accessed September 17, 2008.
[3] http://www2.census.gov/pub/outgoing/govs/special60/, accessed September 17, 2008.
[4] http://www.etax.dor.ga.gov/PTD/cds/csheets/millrate.aspx, accessed September 17, 2008.
[5] http://www.etax.dor.ga.gov/salestax/index.aspx, accessed September 17, 2008.
[6] http://www.bls.gov/lau/#tables, accessed September 17, 2008.

expressed in current dollars. We use a logarithm transformation to stabilize the variance of random or seasonal fluctuations in the monetary variables.

Empirical Methodology

To examine the impact of local government spending on economic growth in Georgia, we use the pooled ordinary least squares (OLS) estimation and a two-stage least square (2SLS) procedure. In addition, we apply various econometric techniques in an attempt to address potential econometric issues. A natural logarithm transformation is applied to most explanatory variables in order to reduce the potential nonlinear effects of and the variability in the data. We also control for potential heteroskedasticity in the error term. Heteroskedasticity is present whenever the variance of per capita personal income growth rate changes with any of the explanatory variables. In the presence of heteroskedasticity, the OLS estimation is no longer efficient. To correct the standard errors for heteroskedasticity, the results will be reported using the White heteroskedasticity-robust standard errors.

Another important econometric issue that has been frequently raised in the economic development literature is the simultaneous equation bias (this is another form of endogeneity of explanatory variables). The simultaneity bias would arise when one or more explanatory variables are determined simultaneously with the dependent variable and thus correlated with the error term. In this empirical analysis, the problem of simultaneity arises because the level of local expenditures (and tax revenues) might be explained in part by economic growth at the county level. Various approaches could be used to correct or reduce the simultaneity bias that generally affects an OLS estimation of an equation in a simultaneous equations model (SEM).

One of these approaches would be to estimate the relationship between the percentage change in per capita personal income and government expenditures at the local level using a two-stage least squares (2SLS) procedure, i.e. an instrumental variables estimation technique where instruments (new exogenous variables) are introduced to replace the problematic explanatory variables.

Another approach would be to use lagged values of the explanatory variables instead of the contemporary observations in the model specification. The lagged

values would then be considered as pseudo-instruments in the regression and their effect would be to lessen the endogeneity issue stemming from the causality of the relationship between local per capita income growth rate and local expenditures (and tax revenues) or simply allow us, to some extent, to avoid the simultaneity problem. It could also be argued that the effects of local spending on the percentage change in per capita income are not immediate and that therefore introducing lagged explanatory variables in the model specification would be more appropriate.

Empirical Results and Discussion

Estimation Results with Current Local Government Finance Data

The 2SLS estimation results suggest that per capita total debt outstanding at the end of the fiscal year is the only government finance variable in our model that is found to promote economic growth at the local level. The estimated coefficient on outstanding debt per capita is positive and statistically significant at the 5 percent level; which indicates that, on average, a 1 percentage point increase in outstanding debt per capita will result in approximately a 2.5 percentage point increase in per capita personal income growth, holding everything else constant.

This result could be explained by the fact that per capita total debt outstanding at the end of the fiscal year represents short-term and long-term commitments to improve and maintain utilities and educational quality. As expected and previously discussed, any infrastructure improvements should promote economic growth.

Additionally, it is not surprising that current growth in per capita income at the county level is affected by past economic growth (lagged one time period i.e. five years). The estimated coefficient on past economic growth is positive and significant at the 10 percent level. This result indicates that if the growth rate of per capita income 5 years ago was 1 percent higher, then the growth rate of per capita income today is expected to be on average about 0.16 percent higher, holding everything else constant.

The finding concerning the impact of the average annual unemployment rates is consistent with the theory; a high annual average unemployment rate will detract

from economic growth. The coefficient on the annual average unemployment rate is negative and equal to 1.14 percent and is significant at the 5 percent level.

Among the remaining expenditure variables, results suggest that per capita expenditure on sewerage appears to be negatively related to local economic growth. Based on our hypotheses, we would expect per capita spending on sewer systems to be associated with economic growth at the local level, considering that enterprise funds expenditures for sewer construction, operation, and maintenance are considered significant factors in industrial location to the extent that they finance infrastructure improvement essential to attract businesses. Surprisingly, the estimated coefficient on per capita spending on sewage systems is negative and statistically significant at the 5 percent level, and this result proved robust to another model specification where the percentage change in the per capita personal income is regressed on local government finance variables lagged one time period. In the context of Georgia, this unexpected result could be explained by the fact that what matters most to promote economic growth at the county level would be the water and sewer capability or efficacy rather than the level of spending on sewer systems itself. Currently, Georgia is facing serious sanitary and combined sewer overflows, especially in urban areas, despite considerable amounts of money spent on the sewer system.[1] As explored in the second section of the report, enterprise funds expenditures, especially water and sewer systems represented the largest share of per capita total expenditures across all reporting counties between 1997 and 2007. This may potentially discourage businesses looking to relocate or expand due to foreseen increases in the cost of doing business in a particular locality.

Finally, the 2SLS estimated coefficients also suggest that per FTE student spending on elementary and secondary education is positively related to economic growth although the effect is not statistically significant.

Additionally, estimated coefficients on per capita expenditures on health and hospitals and public welfare take on the expected sign but they have no significant

[1] See http://ga.water.usgs.gov/publications/wrir00-4139.pdf, and http://ga.water.usgs.gov/publications/abstracts/wrir96-4302.html, accessed October 10, 2008.

effect on per capita income growth rate at the county level in Georgia, and so are property and sales tax rates.

Estimation Results with Lagged Local Government Finance Data

As aforementioned, an alternative specification model was estimated for the purpose of sensitivity analysis, using local government finance variables lagged one time period as explanatory variables. In general, the results remain robust to the change in specification. However, now the estimated coefficient on the county sales tax rate is negative and statistically significant at the 10 percent level. Specifically, if the sales tax rate at the county level 5 years ago was 1 percent lower, then the growth rate of per capita income today would be on average about 1.24 percent higher, holding everything else constant. This result, although not robust against alternative model specification, seems to confirm that local tax policy may affect business location decisions and thus economic activity.

Summary

This report analyzes the effect of local government spending on economic growth at the county level in the state of Georgia. This study is of particular interest from a policy design point of view for the reason that if there is evidence of a positive effect of various categories of local government expenditure on economic growth, it would be imperative to identify adequate spending compositions needed to improve the growth impact of these local government spending policies.

An important finding is that per capita total debt outstanding at the end of the fiscal year seems to promote economic growth at the local level. The Census Bureau classifies the "purpose" of state and local government long-term debt in two categories: (a) *general debt* which includes elementary and secondary education, higher and other education, public debt for private purposes, and all other debt; (b) *utility debt* which includes water supply systems, electric power systems, natural gas supply systems, and public mass transit systems (U.S. Census 2006). Per capita total debt outstanding at the end of the fiscal year thus represents short-term and long-term commitments on the part of the counties to improve infrastructure in terms if utilities and educational quality. As such, short-term and long-term total outstanding debt per

capita would reflect investments that would improve the well-being of the county level population at large.

Contrary to what might reasonably be expected, we also found that per capita expenditure on sewerage and per capita spending on highways appear to be negatively related to local economic growth. In the context of Georgia, with regard to the sewer system, this unexpected result could be explained by the fact that what matters most to promote economic growth at the county level would be the water and sewer capability or efficacy rather than the level of spending on sewer systems itself. Currently, Georgia is facing serious sanitary and combined sewer overflows, especially in urban areas, despite considerable amounts of money spent on the sewer system. This may potentially discourage businesses looking to relocate or expand due to foreseen increases in the cost of doing business in a particular locality. With regard to highway expenditures, the negative impact on economic growth may stem from "pork barrel" politics that would transform per capita spending on highways at the county level from mainly an investment function to a consumption function.

In general, our empirical analysis of local government expenditures and economic growth reveals that government expenditures have no predictable statistical significance on economic growth at the county level in Georgia. According to the Local Government Finance Highlights Report (2007), administration costs by counties in Georgia amounted to $981.42 million (12.21% of total expenditures) respectively in 2006, compared to $139 million on public works, $153 million on community development, $441.15 million for highways, streets and drainage, and $255,000 in spending for education. In order to improve the process by which local government expenditure policies shape the prospect of economic growth, rather than focusing on levels of government expenditures alone, it would appear beneficial to local governments in Georgia to focus on strengthening economic fundamentals such as safe and good quality roads and access to good quality highways or railroad, efficient utility systems, and skilled labor.

I. Introduction

This report is a technical analysis that estimates the effect of local government spending on economic growth at the county level in Georgia. Recent studies in the growth and economic development literature have emphasized the impact of government spending on growth at the national and state levels, but few of these studies have attempted to identify growth–enhancing government expenditures at the local level. Such studies are of great importance from a policy design point of view for the reason that if there is evidence of a positive effect of government spending on economic growth, it would be imperative to identify the adequate spending compositions needed to improve the growth impact of local government spending.

The report begins with an account of the potential links between economic growth and local government expenditures. Section III provides a brief survey of the economic development literature at the local level. In Section III, we describe the data and the empirical estimation procedures. Section VI presents the econometric results and Section V concludes and provides policy recommendations.

II. Potential Links between Economic Growth and Local Government Expenditures

According to Bartik (2003), Bell et al. (2005), and the local economic development literature in general, economic growth and economic development in a particular jurisdiction are primarily determined by the strength of the private sector in that jurisdiction; in particular, its level of investment and economic activity. Furthermore, theoretical and empirical literature on the determinants of growth and development and surveys of business executives suggest that business location decisions are first and foremost affected by factors (or economic fundamentals) such as access to markets, cost and quality of labor, quality transportation systems and infrastructure (e.g. roads, highways, airports, railroad systems, telecommunications, and sewer systems), access to raw materials and supplies, utility costs, and measures of quality of life such as good schools, quality institutes of higher education, health services, recreational facilities, low crime, affordable housing, and good weather.

The aforementioned studies argued that through their discretionary power over taxing and spending policies and regulatory policies, state and local governments may affect economic growth and economic development by developing and investing in public services that have a positive impact on the above mentioned economic fundamentals; fundamentals that are crucial in attracting businesses and economic activity in a specific jurisdiction. Specifically, Bell et al. (2005) indicated that in general, survey research studies have led to the conclusion that "state and local spending in a number of sectors that influence directly the cost of doing business and the quality of the labor force rank ahead of taxes as a major determinant in business location decisions" (Bell et al. 2005, 56). In other words, although local tax policy as well as economic fundamentals has been known to affect business location decisions, what matters more than the level of tax in a particular locality is how revenues are used to finance local public services that prove attractive to businesses looking to relocate or expand. It is within this context that we examine the extent to which local government expenditures affect economic growth at the county level in Georgia.

As mentioned above, various public services are fundamental to attract and sustain private sector investment and economic activity which constitute the engine

of growth and development in a particular locality. To a firm that chooses to operate in a jurisdiction, local public services could either lead to a significant cost reduction or be perceived as providing an attractive amenity to its workers. Some of these local public services are transportation (safe and good quality roads and access to highways or railroad), efficient utility systems, education (skilled labor), and quality of life factors such as health services, recreational amenities, public safety, and affordable housing (Bell et al. 2005). Table 1 below shows the magnitude and trends of local public expenditures at the county and municipal levels in Georgia over a 10-year period from 1997 to 2007.[1] As seen there, the per capita levels of county-level expenditures has increased for most expenditures over the last ten year. The distribution of expenditures among items has remained roughly the same over the last ten years with enterprise fund expenditures comprising the largest share (about 25 percent) of per capita total expenditures for those items shown in Table 1. Similar trends are observed at the municipal level in Georgia.

Beyond the question of how local governments could affect economic growth through their provision of local public services, there is also the issue of reverse causality, namely that economic growth could potentially induce larger local government expenditures (this is the endogeneity or simultaneity bias). Evidently, if expenditure variables are not strictly exogenous, the resulting empirical estimation of the impact of local public spending on economic growth would be in general biased and inconsistent. Section III provides further detail as to some approaches taken to correct or reduce this endogeneity issue.

[1] The Georgia Department of Community Affairs (DCA)'s Fiscal Planning Guide provides data collected from counties, consolidated governments, and municipal governments in Georgia. Entities such as school boards and independent authorities are not included in the annual survey of local government finances. http://www.dca.state.ga.us/development/research/programs/fpg.asp, accessed November 27, 2008.

TABLE 1. RANKING OF PER CAPITA EXPENDITURES BY TYPE (COUNTY AND MUNICIPAL FISCAL PLANNING GUIDE)

County Level	Enterprise Fund Expenditures*		Health/Human Services		Police/Fire Department		Highways		Community Development/Leisure		Education	
	pc amount** ($)	% of total exp	pc amount ($)	% of total exp	pc amount ($)	% of total exp	pc amount ($)	% of total exp	pc amount ($)	% of total exp	pc amount ($)	% of total exp
1997	178.48	18.2%	131.54	13.4%	66.2	6.8%	42.23	4.4%	34.15	3.5%	1.54	0.2%
1998	201.29	20.6%	131.89	13.5%	68.06	7.0%	40.09	4.1%	36.53	3.7%	2.49	0.3%
1999	216.32	20.2%	137.78	12.9%	75.77	7.1%	43.79	4.1%	38.62	3.6%	2.26	0.2%
2000	261.46	24.3%	131.6	12.2%	76.45	7.1%	41.97	3.9%	40.05	3.7%	2.43	0.2%
2001	233.97	21.5%	128.38	11.9%	85.22	7.9%	45.65	4.2%	47.44	4.3%	4.31	0.4%
2002	272.87	25.0%	142.51	13.0%	88.01	8.0%	44.68	4.1%	45.77	4.2%	1.17	0.1%
2003	273.93	23.2%	234.6***	19.8%	96.85	8.2%	46.39	3.9%	48.57	4.1%	0.54	0.0%
2004	331.10	28.4%	149.52	12.8%	101.96	8.8%	46.57	4.0%	49.85	4.3%	0.57	0.0%
2005	293.57	24.9%	155.27	13.1%	101.24	8.6%	51.17	4.4%	51.79	4.3%	1.7	0.1%
2006	332.14	26.0%	163.39	12.6%	109.62	8.5%	52.42	4.1%	55.29	4.3%	0.69	0.1%
2007	323.26	25.8%	126.41	10.1%	107.79	8.6%	54.26	4.4%	50.93	4.0%	0.89	0.1%

Municipal Level	Enterprise Fund Expenditures*		Health/Human Services		Police/Fire Department		Highways		Community Development/Leisure		Education	
	pc amount** ($)	% of total exp	pc amount ($)	% of total exp	pc amount ($)	% of total exp	pc amount ($)	% of total exp	pc amount ($)	% of total exp	pc amount ($)	% of total exp
1997	2,306.50	57.1%	22.78	0.5%	306.06	7.5%	80.26	2.0%	101.21	2.5%	0.00	0.0%
1998	2,060.02	62.3%	22.10	0.6%	317.00	9.5%	80.78	2.4%	109.13	3.2%	0.00	0.0%
1999	2,333.66	61.0%	51.10	1.3%	260.15	6.8%	75.90	1.9%	93.08	2.5%	189.53	5.0%
2000	2,509.38	64.1%	64.37	1.7%	259.60	6.7%	71.10	1.8%	91.64	2.3%	126.84	3.2%
2001	2,708.91	63.5%	56.29	1.3%	279.45	6.5%	78.87	1.8%	102.06	2.4%	156.31	3.7%
2002	2,660.39	61.7%	298.70	6.9%****	292.36	6.8%	84.26	2.0%	105.57	2.4%	214.43	5.0%
2003	3,029.09	68.4%	139.33	3.2%	289.45	6.5%	74.46	1.6%	105.33	2.4%	190.48	4.3%
2004	3,139.37	69.5%	55.95	1.3%	302.21	6.7%	77.61	1.8%	108.30	2.4%	206.13	4.6%
2005	3,869.87	72.6%	55.46	1.1%	314.31	5.9%	80.50	1.6%	116.98	2.1%	263.58	5.0%
2006	4,002.72	70.2%	71.64	1.4%	339.47	5.9%	89.46	1.6%	126.34	2.2%	182.53	3.2%
2007	2,875.63	63.2%	57.20	1.2%	302.37	6.6%	82.70	1.9%	117.55	2.6%	141.05	3.1%

Source: Georgia Local Government Finances, Fiscal Planning Guide, the Georgia Department of Community Affairs (DCA), http://www.dca.state.ga.us/development/research/programs/fpg.asp, accessed November 27, 2008.

Note: *Enterprise funds include water and sewer systems, electric supply systems, natural gas systems, public airports, and solid waste systems.

**Per capita (pc) amount represents the total amount for each item or category divided by the total estimated population of all jurisdictions reporting that amount.

*** This figure is explained by the DRH physical and mental health grants comprising the second largest share (about 9.9 percent) of per capita total expenditures after the water and sewer system in 2003.

**** In 2002, the state DRH physical and mental health grants amounted to 5.3 percent of per capita total expenditures, which accounts for the higher share of health and human services expenditures in 2002.

III. Previous Research

In recent years very few studies have attempted to analyze the effects of local government expenditures on economic growth or on economic development. Jones (1990) highlighted two shortcomings associated with previous studies that focused on the relationship between state expenditures (or aggregates of state and local spending) and economic development. On the one hand, he argued that state-level studies tend to aggregate all public expenditures together; therefore they fail to distinguish among categories of spending that may promote economic growth or detract from it. On the other hand, state-level studies investigating the impact of government spending on economic growth tend to ignore the effects of government expenditures at the local level.

To address these shortcomings, Wink and Eller (1998) examined the effects of local government expenditures on economic growth in 100 North Carolina counties (and major cities within these counties) between 1981 and 1990. The authors chose the change in per capita income at the county level as an indicator of economic growth. The following variables were used to explain economic growth: (a) Expenditure variables, including infrastructure spending per capita, local spending for transportation (paved-highway mileage per capita), culture and recreation spending per capita, city and counties per capita educational expenditures (including county per student education spending and debt service expenditures per capita for schools). These local government spending policies in North Carolina are expected to have a positive effect on per capita income growth; (b) Demographic variables such as urbanization, the percentage of population on AFDC,[2] and the rate of unemployment at the county level were also identified as factors potentially influencing economic growth at the county level. In addition, the change in state per capita income was also included in the empirical analysis in order to capture the effects of changes in the state economy on county economies. The empirical results indicated that economic growth in North Carolina counties is principally determined by the change in state per capita income and by paved-highway mileage per capita. More precisely, they found that a one percent change in state per capita income increases county income by

[2] AFDC = Aid to Families with Dependent Children.

around 0.7 percentage points holding everything else constant. The estimated coefficient on paved-highway mileage per capita is around 0.860 and statistically significant at the 1 percent level, suggesting that a quality transportation system will contribute to local economic growth. The results also revealed that the estimated coefficient on education spending is positive, but very small and statistically significant at the 10 percent level, indicating that education spending was not a strong predictor of counties income change between 1981 and 1990 in North Carolina.

In the next section, we describe the data used in the empirical analysis as well as the statistical estimation procedures applied.

IV. Empirical Analysis

1. Variables Description and Data Sources

In this report, we examine whether local expenditures at the county level affect economic growth in Georgia. The data used are for all 159 counties in the state pooled over the years 1992, 1997, and 2002. In the economic development literature at the state and local levels, there are various measures of economic growth: gross state product, creation of new businesses, employment and unemployment, changes in personal income, and changes in per capita personal income. In this study, we choose change in per capita personal income as the variable of interest to represent economic growth for the reason that it reflects per person changes in economic well-being at the county level.

The dependent variable is therefore the change in per capita personal income at the county level reported by the Bureau of Economic Analysis (it is a five-year growth rate since the data cover the years 1992, 1997, and 2002). The choice of explanatory variables presented in detail below stems from previous literature on economic development policy and from the data available at the local level in Georgia.

The first seven independent variables represent government expenditures at the county level and are drawn from the U.S. Census Bureau (U.S. Census, County Area Finance). At this stage, it is important to note that the government finance variables considered in this report represent government finances of *all* local governments aggregated at the county area level (US Census, County Area Finance *Data User Notes*).[3]

The first variable represents total expenditures allocated to elementary and secondary education per Full-Time Equivalent (FTE) student at the county level. The FTE enrollment data comes from the Georgia Department of Education. We would expect the education variable to have a positive effect on economic growth as measured by the percentage change in per capita income insofar as, according to the general consensus, a well-educated and highly-skilled workforce delivers growth.

[3] http://www2.census.gov/pub/outgoing/govs/special60/, accessed September 17, 2008.

The second explanatory variable pertains to health and hospitals per capita expenditures. According to Jones (1990), it is commonly expected that the relationship between health and hospitals and economic growth will be negative for the reason that health and hospital spending seems to be primarily a social consumption or a social expense destined to "subsidize the costs of labor" and, as such, is expected to be associated with economic decline. The same is true for welfare expenditures assumed to detract from economic growth because they consume available government revenues without replenishing.[4] However, on the other hand it could also be argued that health and hospital expenditures would contribute to economic growth to the extent that they fuel research and development (R&D) necessary for innovation and capacity building in the health sector, among other things.

Previous empirical evidence at the state level has shown that police and fire protection per capita spending have a positive and significant effect on some measures of economic development such as employment, income, capital spending, gross state product, and investment (Fisher 1997). However, few studies examined the effects of public safety spending on economic development at the local government level. Luce (1994) analyzed the effects of public sector tax and spending decisions on various sectors' total employment at the municipality-level in the entire Philadelphia metropolitan area. He found a positive and significant effect of public safety/public works spending on manufacturing, service and wholesale total employment. This is explained by the fact that firms directly consume these local public services and they are consequently factored in their location and production decisions. Similarly, we may hypothesize a positive relationship between police and fire protection expenditures and economic growth when applying the rationale that the maintenance of public order may contribute to economic development.

Another category of expenditure variables pertains to housing and recreational per capita expenditures. It is posited that spending on housing, on community development, parks and recreation will have a positive impact on

[4] Jones (1990) distinguished between government *investment* policies that promote economic growth (e.g. transportation services) and government *consumption* policies (e.g. welfare) that are associated with economic decline even though they are likely justifiable on equity or equality grounds.

economic growth as they enter as determinant factors of business and worker relocation decisions.

Additionally, it seems to be a general consensus that building and maintaining good quality roads and highways would be an important economic development strategy to attract new businesses and jobs and enhance productivity at state and local government levels. Highway per capita expenditures at the local level could therefore be expected to promote economic growth.

Finally, other expenditure variables include enterprise funds expenditures such as sewer systems which are also considered a significant factor in industrial location. The per capita total debt outstanding at the end of the fiscal year which represents short-term and long-term commitments to improve and maintain utilities and educational quality is also incorporated in the model estimation.[5] These latter two independent variables are hypothesized to promote economic development at the local level to the extent that they will finance infrastructure improvement essential to attract businesses.

In addition to the expenditure and debt variables aforementioned, we also consider the following independent variables in the empirical model.

A variable capturing county urbanization level is introduced to control for the advantage urbanized counties would have in attracting new businesses; advantage in terms of larger markets, adequate supply of human capital, and greater access to financial capital. It is therefore anticipated that compared to a rural county, an urbanized county should have a higher growth rate of per capita personal income. Following Wink and Eller (1998), we defined an urbanized county as one with a population of 100,000 people or more. Finally, unemployment rates (annual averages) at the county level in Georgia are also included in the empirical specification. The unemployment data are drawn from the Bureau of Labor Statistics (Local Area Unemployment Statistics). It is posited that higher unemployment rates should be associated with economic decline.

[5] The Census Bureau classifies the "purpose" of state and local government long-term debt in two categories: (a) *general debt* which includes elementary and secondary education, higher and other education, public debt for private purposes, and all other debt; (b) *utility debt* which includes water supply systems, electric power systems, natural gas supply systems, and public mass transit systems (U.S. Census 2006).

Finally, property tax rates and general sales tax rates at the county level are taken into consideration in the model. According to the existing literature on the impact of taxation on economic growth, local government taxation as well as public spending has been known to affect business location decisions and thus economic activity. Specifically, it is posited that an increase in such local taxes while holding constant the level and quality of public spending would result in a decrease in economic activity (Bell et al. 2005; Fisher and Ditsler 2003). However, there remains no consensus on the magnitude of these effects partly because other more important factors influence investment decisions and also because taxes, as business location criteria, vary across different business sectors or industry groups (Fisher and Ditsler 2003; Fisher 1997).

Between 2007 and 1997, the various categories of local government expenditures included in this study represented on average 52.9 percent of per capita total expenditures across all reporting counties in Georgia. In 2007, property taxes and general sales taxes represented the largest sources of revenue at the county level in Georgia, with respectively 19.4 percent and 34.2 percent of the per capita total revenue across all reporting counties (Georgia Local Government Finance 2007).

The resulting dataset is a county-level independently pooled cross-section dataset from all 159 counties in Georgia over the years 1992, 1997, and 2002. It is important to note that all government finance data, which are government finances of *all* local governments aggregated at the county area level, are expressed in current dollars. We will use a logarithm transformation to stabilize the variance of random or seasonal fluctuations in the monetary variables. The description and source of all variables in the study are presented in Table 2 below:

TABLE 2. VARIABLE DESCRIPTIONS

County Level Variables	Description	Sources
Incgrowth	Per capita Personal Income growth (five-year growth rate)	Bureau of Economic Analysis (Local area annual estimates)[1]
Population	Population, in whole numbers	
Educ_Fte	Elementary and Secondary Education, Total Expenditures Per FTE Student ($)	U.S. Census Bureau (County Area Finance) & GA Department of Education (for FTE data)[2]
Fire/police	Police and fire protection, Total Expenditures per capita ($)	U.S. Census Bureau (County Area Finance)[3]
Health_hosp	Health and Hospitals, Total Expenditures per capita ($)	id.
Highways	Total Highways, Total Expenditures per capita aggregated at the county level ($)	id.
Housing/Parks	Housing, Community Development and recreational per capita Expenditures ($)	id.
Welfare	Public Welfare, Total Expenditures per capita ($)	id.
Sewerage	Sewerage, Total Expenditures per capita ($)	id.
Debt	Total Debt Outstanding at the end of the FY per capita ($)	id.
Millrate	Property Tax Rates (Millage Rates, County Unincorporated and School)	Georgia Department of Revenue, (Local Government Services Division)[4]
Salesrate	County Sales Tax Rates (%)	Georgia Department of Revenue[5]
Urban	Dummy Variable equal to 1 if county population >=100,000 and zero otherwise	id.
Unemployment	County Unemployment Rates, Annual Averages (%)	Bureau of Labor Statistics (Local Area Unemployment Statistics)[6]

[1] http://www.bea.gov/regional/reis/default.cfm?catable=CA1-3&section=2, accessed September 17, 2008.
[2] http://app3.doe.k12.ga.us/ows-bin/owa/fte_pack_enrollgrade.entry_form, accessed September 17, 2008.
[3] http://www2.census.gov/pub/outgoing/govs/special60/, accessed September 17, 2008.
[4] http://www.etax.dor.ga.gov/PTD/cds/csheets/millrate.aspx, accessed September 17, 2008.
[5] http://www.etax.dor.ga.gov/salestax/index.aspx, accessed September 17, 2008.
[6] http://www.bls.gov/lau/#tables, accessed September 17, 2008.

2. Empirical Methodology

To examine the impact of local government spending on economic growth in Georgia, we use the pooled ordinary least squares (OLS) estimation and a two-stage least square (2SLS) procedure. In addition, we apply various econometric techniques in an attempt to address potential econometric issues. A natural logarithm transformation is applied to most explanatory variables in order to reduce the potential nonlinear effects of and the variability in the data. We also control for potential heteroskedasticity in the error term. Heteroskedasticity is present whenever the variance of per capita personal income growth rate changes with any of the explanatory variables. In the presence of heteroskedasticity, the OLS estimation is no longer efficient. To correct the standard errors for heteroskedasticity, the results will be reported using the White heteroskedasticity-robust standard errors.

Another important econometric issue that has been frequently raised in the economic development literature is the simultaneous equation bias (this is another form of endogeneity of explanatory variables). The simultaneity bias would arise when one or more explanatory variables are determined simultaneously with the dependent variable and thus correlated with the error term. In this empirical analysis, the problem of simultaneity arises because the level of local expenditures (and tax revenues) might be explained in part by economic growth at the county level. Various approaches could be used to correct or reduce the simultaneity bias that generally affects an OLS estimation of an equation in a simultaneous equations model (SEM).

One of these approaches would be to estimate the relationship between the percentage change in per capita personal income and government expenditures at the local level using a two-stage least squares (2SLS) procedure, i.e. an instrumental variables estimation technique where instruments (new exogenous variables) are introduced to replace the problematic explanatory variables.

Another approach would be to use lagged values of the explanatory variables instead of the contemporary observations in the model specification. The lagged values would then be considered as pseudo-instruments in the regression and their effect would be to lessen the endogeneity issue stemming from the causality of the relationship between local per capita income growth rate and local expenditures (and

tax revenues) or simply allow us, to some extent, to avoid the simultaneity problem. It could also be argued that the effects of local spending on the percentage change in per capita income are not immediate and that therefore introducing lagged explanatory variables in the model specification would be more appropriate.

To test the set of hypotheses aforementioned in Section III.1 concerning the impact of local government expenditures on economic growth, we therefore estimate an empirical model specification where the dependent variable, the percentage change in the per capita personal income at the county level, is regressed on the following explanatory variables using OLS estimation:

$$incgrowth = \alpha + \beta_1 incgrowth_{t-1} + \beta_2 leduc - fte + \beta_3 lhealth\_hosp + \beta_4 lhighway + \beta_5 lwelfare + \beta_6 lhousing\_park + \beta_7 lfire\_police + \beta_8 ldebt + \beta_9 lsewerage + \beta_{10} millrate + \beta_{11} lsalesrate + \beta_{12} urban + \beta_{13} unemployment + \varepsilon, \quad (1)$$

where *incgrowth* is the five-year growth rate of the per capita personal income at the county level and $incgrowth_{t-1}$ is a one-period lag of the dependent variable. This latter variable allows us to control for county-specific initial factors in each county that could cause current differences in the percentage change of per capita personal income.[6] As previously described in Table 2, *leduc-fte* is the total expenditures allocated to elementary and secondary education per FTE student; *lhealth_hosp* is the health and hospitals per capita expenditures; *lhighway* is the highway per capita expenditures; *lwelfare* is the welfare total per capita expenditures; *lhousing_park* is the per capita total spending on housing, community development, parks and recreation; *lfire_police* is the police and fire protection per capita total spending; *lsewerage* is the per capita total sewerage expenditures; and *ldebt* is the per capita total debt outstanding at the end of the fiscal year. All local government expenditure and debt variables are expressed in natural logarithm terms. Regarding the tax policy variables, *millrate* is millage rate at the county unincorporated taxing district; and *salesrate* is the county sales tax rate expressed in percentage and excluding state sales tax.

[6] These are initial factors that affected the local governments' comparative advantage such as initial economic and social conditions, consumers' preference for climate, prior economic development activities financed by a local government in order to attract and retain new businesses.

The dummy variable *urban* is equal to one if a county population has 100,000 people or more. Finally, *unemployment* is the unemployment rate expressed as annual averages. The error term ε contains unobserved factors that could influence economic growth at the local level.

As described previously, one approach to address the underlying simultaneity problem inherent in Equation (1), as economic growth also influences local government spending, would be to estimate the model using a two-stage least squares (2SLS) procedure. The instruments used in the 2SLS estimation are one-period lagged values of the local government finance variables. To test the validity of our instruments, we run the first-stage regressions for each of the current expenditure variables. Results showed that all instruments have statistically significant coefficients (at the 1 percent level).

We also check the robustness of our results by considering an alternative regression (see below) where the dependent variable, the percentage change in the per capita personal income at the county level, is regressed on local government finance variables lagged one period (i.e. five years) using an OLS estimation:

$$incgrowth = \alpha + \beta_1 incgrowth_{t-3} + \beta_2 leduc - fte_{t-1} + \beta_3 lhealth\_hosp_{t-1} + \beta_4 lhighway_{t-1} + \beta_5 lwelfare_{t-1} + \beta_6 lhousing\_park_{t-1} + \beta_7 lfire\_police_{t-1} + \beta_8 ldebt_{t-1} + \beta_9 lsewerage_{t-1} + \beta_{10} millrate_{t-1} + \beta_{11} lsalesrate_{t-1} + \beta_{12} urban + \beta_{13} unemployment + \varepsilon, \quad (2)$$

As before, all local government expenditure and debt variables are expressed in natural logarithm terms but this time they are lagged one time period (i.e. five years). The next section discusses the estimation results.

V. Empirical Results and Discussion

We start by presenting the descriptive statistics on the dependent and expenditure variables. Then we discuss the model estimation results obtained using the OLS and 2SLS estimation approaches.

Table 3 presents the summary statistics of all variables included in the estimation model. From 1992 to 2002, the nominal average per capita income at the county level in Georgia amounted to around $19,000 ranging from $11,200 to $45,700, with an average five-year growth rate of around 25 percent.

TABLE 3. DESCRIPTIVE STATISTICS

Variable	Obs.	Mean	Std. Dev.	Min	Max
incgrowth	477	24.56135	9.197134	-7.538019	58.41669
income	477	18,956.23	4,517.61	11,248	45,717
population	477	47,767.93	99,416.46	1,813	817,510
educ_fte	477	6,364.765	2,334.921	3,439.394	21,257.14
fire	477	33.15121	29.93962	0.133174	180.3848
health_hosp	477	341.493	473.3604	4.038905	2,687.954
highways	477	106.3555	54.86285	17.38385	624.124
housing	477	45.12303	53.53047	0	423.7993
parks	477	24.00847	30.99672	0	384.0974
police	477	95.25645	40.07761	13.22042	380.3357
welfare	477	10.32869	14.09588	0	118.9316
fire_police	477	128.4077	62.46025	13.64688	477.2312
housing_parks	477	69.1315	67.45488	0	464.1509
debt	477	1,343.737	3,641.484	5.790646	49,737.04
sewerage	477	46.44978	51.34818	0	455.1646
millrate	466	23.81748	4.80543	7.25	46.37
salesrate	477	6.186583	0.73678	4	8
urban	477	0.077568	0.267772	0	1
unemployment	477	6.233124	2.300446	1.9	18.2

Note: In this table, all finance data and local area personal income levels are in current dollars.

In 1992, eight counties (Columbia, Fulton, Chatham, Forsyth, Fayette, Gwinnett, Cobb, and DeKalb) had the highest per capita income (at least greater than $20,000) with Columbia, Fayette, and Forsyth counties considered rural counties with a population of less than 100,000. During that year, the annual unemployment rate in these counties averaged 5.55 percent, while they spent on average about $6,100 per FTE student. The per capita spending on police and fire protection, and on parks, recreation, housing and community development in these counties averaged $142 and

$80 respectively. The average per capita spending on health and hospitals and on public welfare in 1992 were around $254 and $7 respectively, while highway expenditures amounted to $81. The average five-year growth rate of personal income per capita in these counties that year was 30 percent.

In 2002, the counties with the highest per capita income (at least greater than $30,000) were the same as in 1992 with Cherokee added to the list and Harris County replacing Chatham County. The average five-year growth rate in per capita income that year was 18 percent. These richer counties experienced in 2002 an average annual unemployment rate of 4.3 percent. The average total expenditures allocated to elementary and secondary education per Full-Time Equivalent (FTE) student amounted to approximately $9,600. The average per capita expenditures on fire and police protection was $214 while per capita expenditures on highways averaged $121. In 2002, spending on health and hospitals and on public welfare in the richer counties were $141 and $20 respectively.

Counties with the lowest per capita income (less than or equal to $12,000) in 1992 were Chattahoochee, Long, Charlton, Hancock, and Liberty, with an average five-year growth rate of 21 percent. During that same year, the average numbers were about $4,745 for education spending per FTE student, around $69 per capita spending on police and fire protection, and $22 per capita spending on housing and parks, with an annual unemployment rate averaging 8 percent. The average per capita spending on health and hospitals and on public welfare in 1992 were $214 and $8 respectively in these counties. Per capita expenditures on highways were $58 that same year.

In 2002, counties with the lowest per capita income (less than or equal to $15,000) were Chattahoochee and Wheeler, with an average five-year growth rate of 4.31 percent and an annual unemployment rate of 7.4 percent. The average local government spending on education was about $9,000 per FTE student. Local government spending on police and fire protection amounted to $54 and $45 for housing and parks. The average per capita spending on health and hospitals and on public welfare in 2002 were $18 and $5 respectively in these counties. Per capita expenditures on highways were $42 during that same year.

Overall, from 1992 to 2002, per capita personal income across all counties increased on average but at a slower pace, falling from 32 percent in 1992 to around 18 percent in 2002. In general, the average per capita local expenditures increased during that period, with per capita spending on welfare experiencing the greatest increase.

We now turn to a discussion of an estimate of the effects of local government expenditures on local economic growth. Table 4 presents the estimation results of Equation (1). In general, the OLS model estimation is preferred over the 2SLS approach when the explanatory variables are exogenous because the 2SLS method produces very large standard errors, thus making 2SLS estimators less efficient. We therefore conducted a test for endogeneity of the expenditure and revenue variables to determine whether the 2SLS procedure is necessary in the first place. The endogeneity test is based on estimating the reduced form for each expenditure and revenue variable (potential endogenous variables because of the simultaneity bias aforementioned in Section III) by regressing it on all exogenous variables in Equation (1) (including instruments) and obtaining the residuals. Then, we add these residuals to the structural Equation (1) and test for their joint significance using OLS estimation and an F-test. A joint significance would indicate that at least one expenditure variable is endogenous. Based on the results, we reject the null hypothesis that the residuals in the structural Equation (1) have jointly no effect on the dependent variable (p-value equals 1.57 percent); thus we conclude that at least one suspected expenditure or revenue variable is endogenous. The 2SLS approach is consequently used to solve this problem. Table 4 below reports the OLS and 2SLS estimation results of Equation (1).

We checked the robustness of our results by regressing the percentage change in the per capita personal income at the county level on local government finance variables lagged one time period (i.e. five years) using an OLS estimation. Here, an endogeneity test was also conducted. The results of the test showed that there is no statistical evidence that the one-period lagged expenditure variables in Equation (2) are endogenous, meaning that the use of lagged expenditure variables in this context seems enough to overcome the endogeneity issue. The results are presented in Table 5.

TABLE 4. ESTIMATION RESULTS OF THE EFFECT OF LOCAL GOVERNMENT EXPENDITURES ON ECONOMIC GROWTH (CURRENT FINANCE VARIABLES)

	Specifications			Specifications	
Variables	**OLS**	**2SLS**	**Variables**	**OLS**	**2SLS**
incgrowth_1	0.199***	0.158*	lsewerage	-0.551	-7.419**
	(0.049)	(0.093)		(0.569)	(3.048)
leduc_fte	-6.296***	2.377	millrate	-0.034	0.146
	(1.958)	(5.855)		(0.090)	(0.224)
lhealth_hosp	0.112	-0.527	rate	-0.797	-3.634
	(0.244)	(0.574)		(0.701)	(3.178)
lhighways	-1.136	-6.486	urban	-1.841	-2.286
	(0.947)	(5.529)		(1.661)	(2.628)
lwelfare	-0.169	-0.165	unemployment	-0.018	-1.141**
	(0.413)	(2.873)		(0.215)	(0.455)
lhousingparks	-0.316	-0.205	Constant	82.922***	56.976
	(0.266)	(1.515)		(16.693)	(54.427)
lfirepolice	-0.220	1.372			
	(0.504)	(0.984)	Observations	387	232
ldebt	0.915*	2.506**	R-squared	0.26	
	(0.515)	(1.110)			

Dependent Variable: Five-year growth rate of per capita personal income at the county level.
Note: All local government expenditure and debt variables expressed in natural logarithm. The years used for the regression analysis are 1992, 1997, and 2002. The instruments used in the 2SLS estimation are one-period lagged values of the expenditure variables.
Robust standard errors in parentheses in column (1).
* p<0.1, ** p<0.05, *** p<0.01.

TABLE 5. ESTIMATION RESULTS OF THE EFFECT OF LOCAL GOVERNMENT EXPENDITURES ON ECONOMIC GROWTH (LAGGED FINANCE VARIABLES)

	Specification		Specification
Variables	**OLS-Lagged**	**Variables**	**OLS-Lagged**
incgrowth_3	0.104***	lsewerage_1	-1.476***
	(0.032)		(0.505)
leduc_fte_1	0.097	millrate_1	0.079
	(2.208)		(0.094)
lhealth_hosp_1	-0.130	rate_1	-1.241*
	(0.268)		(0.668)
lhighways_1	-1.496	urban	-2.535
	(1.107)		(1.571)
lwelfare_1	-0.200	unemployment	-0.843***
	(0.388)		(0.244)
lhousingparks_1	-0.271	Constant	28.994
	(0.322)		(18.920)
lfirepolice_1	0.543		
	(0.491)	Observations	241
ldebt_1	0.856**	R-squared	0.24
	(0.378)		

Dependent Variable: Five-year growth rate of per capita personal income at the county level.
Note: All local government expenditure and debt variables expressed in natural logarithm and all government finance variables are lagged one time period. The years used for the regression analysis are 1992, 1997, and 2002.
Robust standard errors in parentheses in column (1).
* p<0.1, ** p<0.05, *** p<0.01.

1. Estimation Results with Current Local Government Finance Data

The 2SLS estimation results in Table 4 suggest that per capita total debt outstanding at the end of the fiscal year is the only government finance variable in our model that is found to promote economic growth at the local level. The estimated coefficient on outstanding debt per capita is positive and statistically significant at the 5 percent level; which indicates that, on average, a 1 percentage point increase in outstanding debt per capita will result in approximately a 2.5 percentage point increase in per capita personal income growth, holding everything else constant.

This result could be explained by the fact that per capita total debt outstanding at the end of the fiscal year represents short-term and long-term commitments to improve and maintain utilities and educational quality. As expected and previously discussed, any infrastructure improvements should promote economic growth.

Additionally, it is not surprising that current growth in per capita income at the county level is affected by past economic growth (lagged one time period i.e. five years). The estimated coefficient on past economic growth is positive and significant at the 10 percent level. This result indicates that if the growth rate of per capita income 5 years ago was 1 percent higher, then the growth rate of per capita income today is expected to be on average about 0.16 percent higher, holding everything else constant.

The finding concerning the impact of the average annual unemployment rates is consistent with the theory; a high annual average unemployment rate will detract from economic growth. The coefficient on the annual average unemployment rate is negative and equal to 1.14 percent and is significant at the 5 percent level.

Among the remaining expenditure variables, results in Table 4 suggest that per capita expenditure on sewerage appears to be negatively related to local economic growth. Based on our hypotheses, we would expect per capita spending on sewer systems to be associated with economic growth at the local level, considering that enterprise funds expenditures for sewer construction, operation, and maintenance are considered significant factors in industrial location to the extent that they finance infrastructure improvement essential to attract businesses. Surprisingly, the estimated

coefficient on per capita spending on sewage systems is negative and statistically significant at the 5 percent level, and this result proved robust to another model specification where the percentage change in the per capita personal income is regressed on local government finance variables lagged one time period (see Table 5 and Subsection 2 below). In the context of Georgia, this unexpected result could be explained by the fact that what matters most to promote economic growth at the county level would be the water and sewer capability or efficacy rather than the level of spending on sewer systems itself. Currently, Georgia is facing serious sanitary and combined sewer overflows, especially in urban areas, despite considerable amounts of money spent on the sewer system.[7] As explored in the second section, enterprise funds expenditures, especially water and sewer systems represented the largest share of per capita total expenditures across all reporting counties between 1997 and 2007. This may potentially discourage businesses looking to relocate or expand due to foreseen increases in the cost of doing business in a particular locality.

Finally, the 2SLS estimated coefficients reported in Table 4 also suggest that per FTE student spending on elementary and secondary education is positively related to economic growth although the effect is not statistically significant.

Additionally, estimated coefficients on per capita expenditures on health and hospitals and public welfare take on the expected sign but they have no significant effect on per capita income growth rate at the county level in Georgia, and so are property and sales tax rates.

2. Estimation Results with Lagged Local Government Finance Data

As aforementioned, an alternative specification model was estimated for the purpose of sensitivity analysis, using local government finance variables lagged one time period as explanatory variables (see Equation 2). In general, the results reported in Table 5 remain robust to the change in specification. However, now the estimated coefficient on the county sales tax rate is negative and statistically significant at the 10 percent level. Specifically, if the sales tax rate at the county level 5 years ago was

[7] See http://ga.water.usgs.gov/publications/wrir00-4139.pdf, and http://ga.water.usgs.gov/publications/abstracts/wrir96-4302.html, accessed October 10, 2008.

1 percent lower, then the growth rate of per capita income today would be on average about 1.24 percent higher, holding everything else constant. This result, although not robust against alternative model specification, seems to confirm that local tax policy may affect business location decisions and thus economic activity.

VI. Summary

This report analyzes the effect of local government spending on economic growth at the county level in the state of Georgia. This study is of particular interest from a policy design point of view for the reason that if there is evidence of a positive effect of various categories of local government expenditure on economic growth, it would be imperative to identify adequate spending compositions needed to improve the growth impact of these local government spending policies.

The data used are for all 159 counties in the state pooled over the years 1992, 1997, and 2002. We chose the per capita personal income growth rate as the variable of interest to represent economic growth for the reason that it reflects per person changes in economic well-being at the county level. The empirical analysis relies on the pooled ordinary least squares (OLS) and two-stage least square (2SLS) estimations when analyzing the impact of current local government expenditures on economic growth. For the purpose of sensitivity analysis, an alternative specification model was estimated, using local government finance variables lagged one time period as explanatory variables

An important finding is that per capita total debt outstanding at the end of the fiscal year seems to promote economic growth at the local level. The Census Bureau classifies the "purpose" of state and local government long-term debt in two categories: (a) *general debt* which includes elementary and secondary education, higher and other education, public debt for private purposes, and all other debt; (b) *utility debt* which includes water supply systems, electric power systems, natural gas supply systems, and public mass transit systems (U.S. Census 2006). Per capita total debt outstanding at the end of the fiscal year thus represents short-term and long-term commitments on the part of the counties to improve infrastructure in terms if utilities and educational quality. As such, short-term and long-term total outstanding debt per capita would reflect investments that would improve the well-being of the county level population at large.

Contrary to what might reasonably be expected, we also found that per capita expenditure on sewerage and per capita spending on highways appear to be negatively related to local economic growth. In the context of Georgia, with regard to the sewer system, this unexpected result could be explained by the fact that what

matters most to promote economic growth at the county level would be the water and sewer capability or efficacy rather than the level of spending on sewer systems itself. Currently, Georgia is facing serious sanitary and combined sewer overflows, especially in urban areas, despite considerable amounts of money spent on the sewer system. This may potentially discourage businesses looking to relocate or expand due to foreseen increases in the cost of doing business in a particular locality. With regard to highway expenditures, the negative impact on economic growth may stem from "pork barrel" politics that would transform per capita spending on highways at the county level from mainly an investment function to a consumption function.

In general, our empirical analysis of local government expenditures and economic growth reveals that government expenditures have no predictable statistical significance on economic growth at the county level in Georgia. According to the Local Government Finance Highlights Report (Georgia Department of Community Affairs 2007), administration costs by counties in Georgia amounted to $981.42 million (12.21% of total expenditures) respectively in 2006, compared to $139 million on public works, $153 million on community development, $441.15 million for highways, streets and drainage, and $255,000 in spending for education. In order to improve the process by which local government expenditure policies shape the prospect of economic growth, rather than focusing on levels of government expenditures alone, it would appear beneficial to local governments in Georgia to focus on strengthening economic fundamentals such as safe and good quality roads and access to good quality highways or railroad, efficient utility systems, and skilled labor.

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About the Author

Nara Monkam is a research associate in the Fiscal Research Center of the Andrew Young School of Policy Studies at Georgia State University. Her research interests include state public finance and development economics especially in the areas of foreign aid, economic and political institutions in Developing Countries. Nara Monkam is from Cameroon and holds a Bachelor's and Master's degrees in Economics from the University of Namur, Belgium, and a Ph.D in Economics from Georgia State University.

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Kenneth J. Heaghney, State Fiscal Economist
Stacie Kershner, Program Coordinator
John W. Matthews, Senior Research Associate
Nara Monkam, Research Associate
Lakshmi Pandey, Senior Research Associate
Dorie Taylor, Assistant Director
Arthur D. Turner, Microcomputer Software Technical Specialist
Sean Turner, Research Associate
Sally Wallace, Associate Director and Professor of Economics
Laura A. Wheeler, Senior Research Associate
Tumika Williams, Administrative Coordinator
John Winters, Research Associate

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Spencer Banzhaf, Associate Professor of Economics
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Paul Ferraro, Associate Professor of Economics
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Jonathan C. Rork, Assistant Professor of Economics
Glenwood Ross, Adjunct Professor of Economics
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Erdal Tekin, Assistant Professor of Economics
Geoffrey K. Turnbull, Professor of Economics
Neven Valev, Associated Professor of Economics
Mary Beth Walker, Associate Professor of Economics
Katherine G. Willoughby, Professor of Public Administration and Urban Studies

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Trends in Georgia Highway Funding, Urban Congestion, and Transit Utilization **(Peter Bluestone)** This report examines transportation funding, as well as urban congestion and transit utilization in Georgia as well as six other states for fiscal years 2000 and 2005. FRC Report 187 (October 2008)

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Distribution of the Georgia Corporate and Net Worth Tax Liabilities, 1998 and 2005 **(Jonathan C. Rork)**. This brief illustrates the distribution of corporate and net worth income tax liabilities among Georgia corporations. FRC Brief 185 (September 2008)

The Effect of Insurance Premium Taxes on Employment **(Martin Grace, David L. Sjoquist, and Laura Wheeler)** This report provides estimates of the effect of the insurance premium taxes on state-level employment in the insurance industry. FRC Report 184 (September 2008)

Variation in Teacher Salaries in Georgia **(John V. Winters)** This report documents the variation in K-12 public school teacher salaries in Georgia and discusses the causes of variation in teacher salaries within and across districts. FRC Report/Brief 183 (August 2008)

A Brief History of the Property Tax in Georgia **(David L. Sjoquist)** This report is a chronology of the development of the property tax system that currently exists in Georgia from the 1852 legislation pointing out significant changes made over the past 156 years. FRC Report/Brief 182 (August 2008)

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Property Tax Limitations **(John V. Winters)** This report discusses property tax limitations in the U.S. and highlights limitations imposed in Georgia. FRC Report 179 (June 2008)

An Analysis of a Need-Based Student Aid Program for Georgia **(Nara Monkam, Lakshmi Pandey, Dana K. Rickman and David L. Sjoquist)** This report explores issues associated with establishing a need-based student aid program in Georgia. FRC Report/Brief 178 (May 2008)

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